Performance Vehicle Telemetry Displays

www.btigauges.com

TFT CAN Bus Dash for ECU Master
Plug and Play Installation Manual
Doc version 1.3

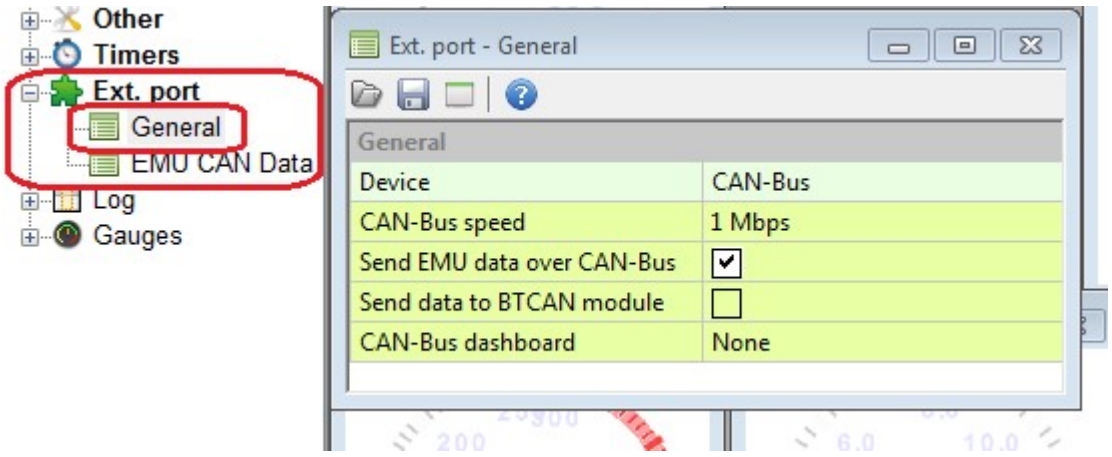
Notice: This product is intended for Off-Road use only. Never take your eyes off of the road while using this device. If you are uncomfortable with wire termination, please have this device installed by a competent shop.

**** Notice! This device should be configured by competent personnel. Raising the BOOST too much or reducing the Traction Control too much can have severe consequences. You could blow your engine and or lose control of your vehicle****

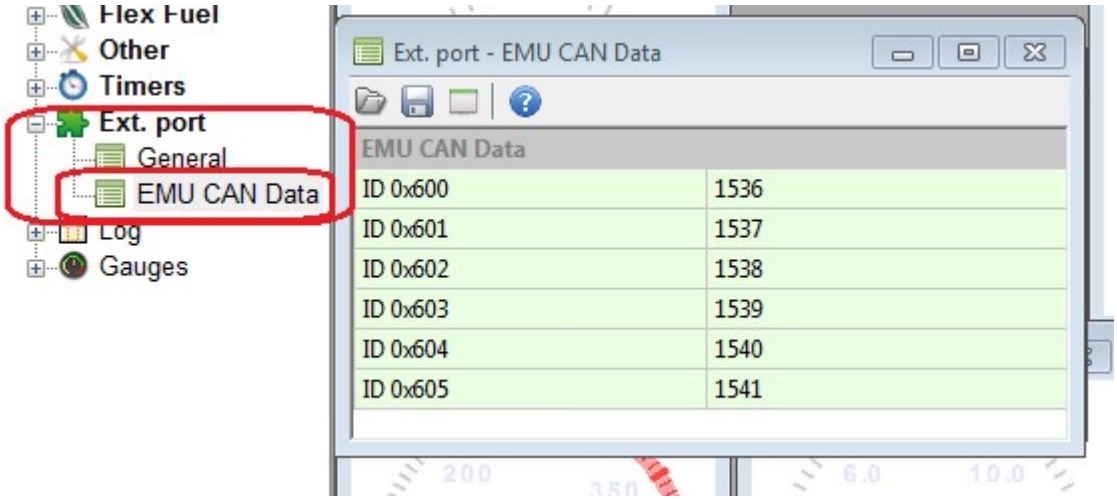
Software Configuration:

The ECU Master software must be configured in order for the BTI CAN gauge to function. The configuration only requires a few steps:

1. Open the client software and expand the “Ext. port” directory. Click on “General” and make sure that “Device” is set to “CAN-Bus”, “CAN-Bus speed” is set to “1 Mbps”, and “Send EMU data over CAN-Bus” is checked.



2. Open the “EMU CAN Data in the “Ext. port” directory and ensure that the “EMU CAN Data” has the following address listed:



Termination:

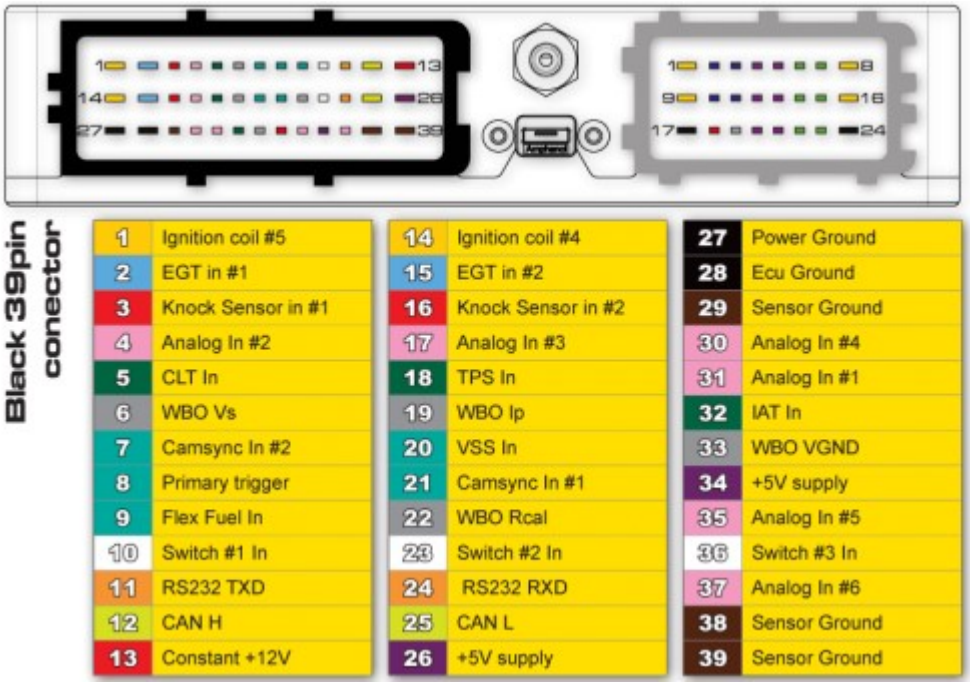
The ECU Master Classic ECU does require that you have the CAN-Bus module in order to have access to the CAN bus feature.

The yellow wire exiting the CAN module is CAN Low and should terminate to the green wire on the BTI gauge harness.

The purple wire exiting the CAN module is CAN High and will terminate to the white wire on the BTI gauge harness.

The red wire on the BTI gauge harness should be tied to ignition +12 Volts while the black wire should be tied to ground.

ECU Master Black Configuration

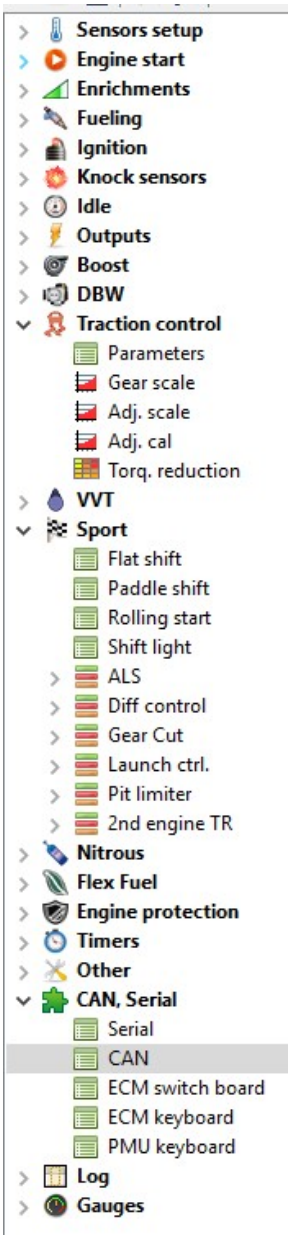


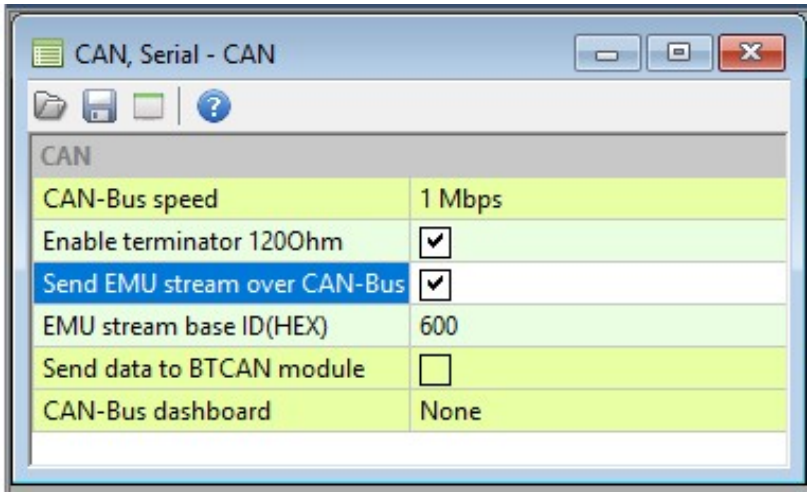
Wire the White wire (CAN high) to pin 12 on the 39 pin connector.

Wire the Green wire (CAN low) to pin 25 on the 39 pin connector. The Black wire will need to be tied to chassis ground and the Red wire will need to be tied to an ignition source that has power only when the ignition is energized.

ECU Master Black Software Configuration

Navigate to the CAN configuration and double click to begin the CAN configuration. Once you are in the CAN configuration, select the following:

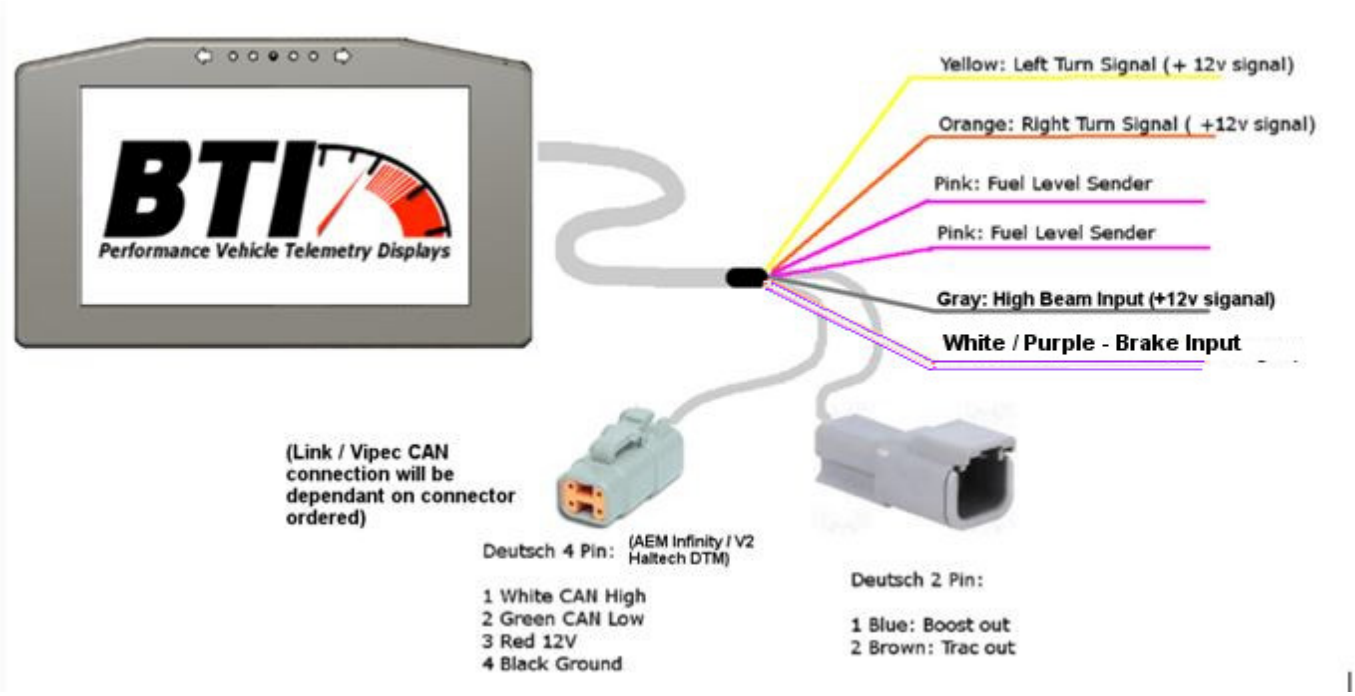


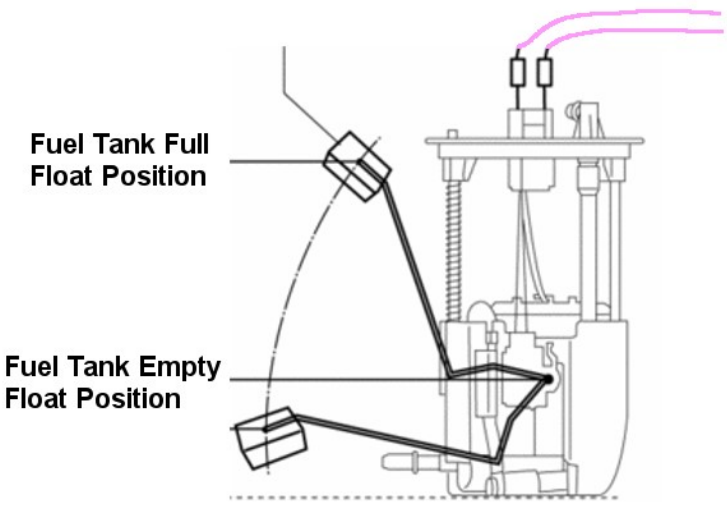


In order to receive instructions from the display to the ECU, we must emulate the “ECU Switch board”

2 Pin Analog Out Connector (Brown and Blue Wires)

The termination of these two wires is dependent on the inputs that are assigned in the ECU Master Tuner Software. The Input used will be defined here. Connect the blue and brown wires to the corresponding inputs that are selected for your application. There are more details regarding this under “BOOST and PWM STEPS” below.

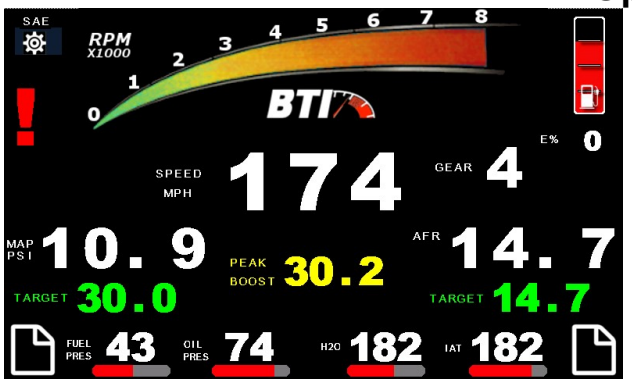




Terminate the Pink wires to the Fuel Tank sending unit. The Sending unit must be isolated from ground or power within the car (just like taking a resistancemeasurementwith a multi-meter) There is no polarity on the pink wires. Consult the vehicle manual to determine the proper wiring. When in doubt, always take your vehicle to a trained professional.

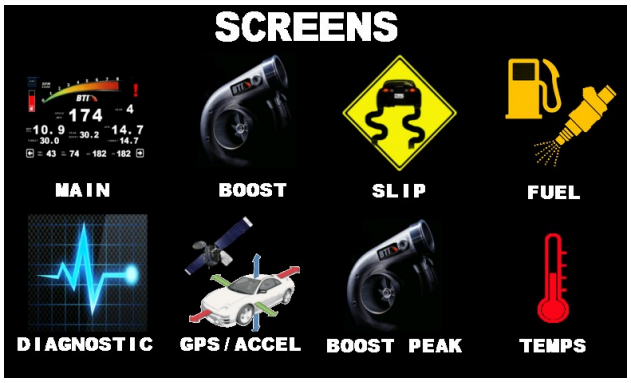
Data LED: (back of the dash) This indicator will flash when ever the gauge is energized and CAN communications are present. Use this to confirm communications.

Operation:



Upon powering up a properly terminated gauge, the Dash will display the interface and version number,
There are two page menu selection buttons at the bottom corner of all operational screens.

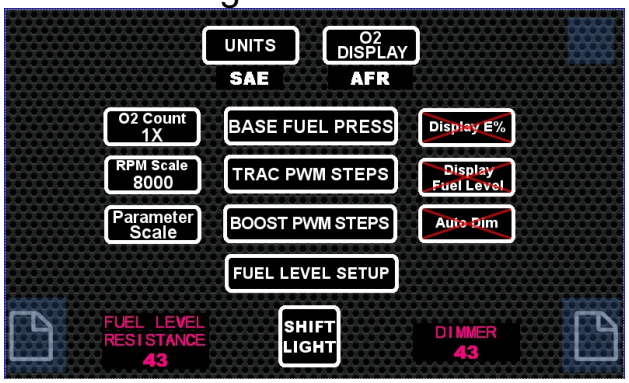
Use this button to ass the page menu:



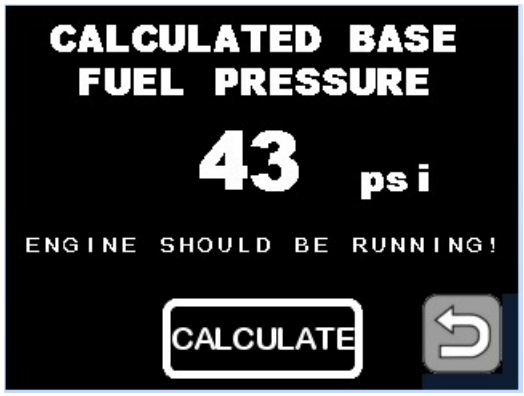
Select the corresponding screen that you wish to view.
Parameter Data Color: The Parameters will be shown in White, Green, Yellow, and Blue.
White: Live Data
Green: Target
Yellow: Peak data (can be reset by touching value in most instances with exception to boost which records its peak by boost episode)
Blue Data: This only appears on the Peak Boost Freeze Frame screen. This is freeze-frame data from the last boost episode. Example: your Manifold Air Pressure goes up to 20 psi, the blue freeze-frame data will be recorded while the Manifold Air Pressure was at its peak.

Dash Setup Options:

Touch the cog wheel on the touch screen in order to configure the gauge. 

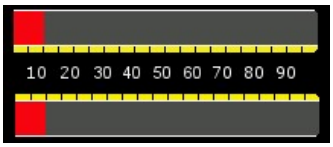


This will bring you into a screen where the Units may be selected, the settings can be accessed, and the shift light may be setup. The Units button will allow the user to toggle between SAE and SI units. This applies to temperature, pressure, speed and distance. The O2 Display button will change how the Oxygen sensor data is displayed. The options are AFR and Lambda.



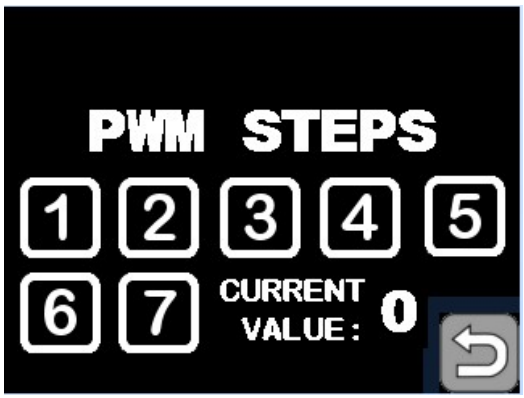
Base Fuel Pressure configuration:

In order to calculate the base fuel pressure, the engine should be idling. Press the CALCULATE button and the base pressure will be calculated and displayed. This is used on the fuel screen in order to graph the fuel pressure vs. boost pressure for simple regulator function verification.



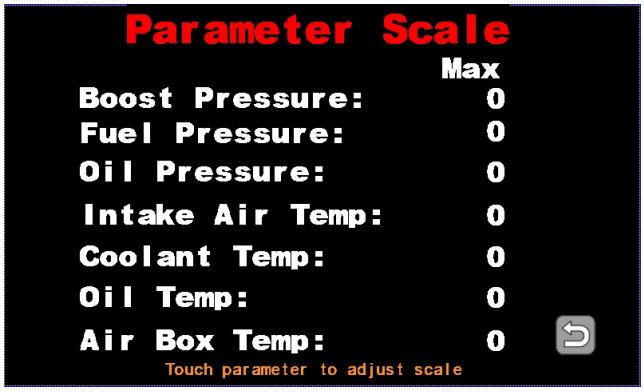
Fuel Level Setup: This is where the fuel level resistance may be programmed in order to take a reading from the fuel level sender. Consult the service manual for the fuel level resistance values.

Example: MKIV Toyota Supra Full = 4 ohms / Empty = 107 ohms.



TRAC and BOOST PWM Steps:
Use these two buttons to configure how many steps are to be programmed in the Infinity Tuner software for Boost and Slip. Typically the scale is from 0-5 volts and the max amount of steps allowed is 7 which give you 8 settings (0-7). Example: a value of 7 here would make each step would have a value of .71 volts. A value of 1 here would give the step a value of 5 volts. It is **imperative** to view each step in the infinity tuner software when configuring this as there could be a potential difference with regard to ground.

** When using the CAN XMIT, Boost PWM steps and TRAC PWM steps will determine the number of steps that are sent over the CAN bus.



Parameter scale: Use this screen to set the maximum range for boost pressure and various temperature slide bars and graphs.
Example: You will be running a 30 psi boost
target. The max boost pressure could be 35 psi
to give the slide bars and graphs the best resolution. The same goes for temperatures. These values should be entered with respect to which units are selected: SI or SAE. If SI units are selected, Boost Pressure should be entered in kPa and temps should be entered in Celsius. If SAE units are selected, Boost Pressure should be entered in psi and temps in Fahrenheit.

O2 Count 1X (2x) Use this to display 1 or 2 wideband sensor readings.
RPM Scale This button switches the RPM scale from 8K RPM to 10K rpm.
Display E% This button adds or removes ethanol content on the screen.
Fuel Level This button adds or removes the fuel level gauge on the screen.
Auto Dim This button enables and disables the auto dim feature.
Warnings Use this to disable the warnings generated by Infinity.
CAN X- MIT Use this feature to enable CAN transmit back to the ECU.

Boost and Trac configuration:

**** Note that these two settings should be configured by competent personnel. Raising the BOOST too much or reducing the SLIP too much can have severe consequences. ****

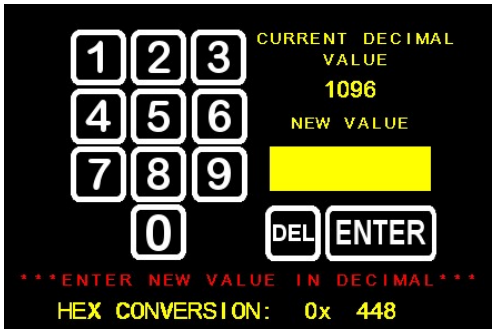
Both the Boost and Traction Control settings must be configured in the ECU Master Tuner software. It is imperative to configure these inputs correctly.
(if you are uncomfortable here, please take your vehicle to a competent shop)

Shift Light Configuration:
Touch the gear that you wish to change the shift light
RPM on. That gear number will appear above the up and down arrows for verification. Use the up and down arrows to adjust the shift light RPM set-point of said gear. Press the back arrow button at the bottom right hand corner to save the settings. PRE-SHIFT will fade the outside orange LEDs in the value less than the assigned RPM per gear. The shift light should flash once the settings are saved.

**Note that CAN XMIT must be enabled in the setup screen.

 Press the white cog wheel in order to enter the CAN control screen:

Press the yellow cog wheel in order to configure the ADR CAN ID

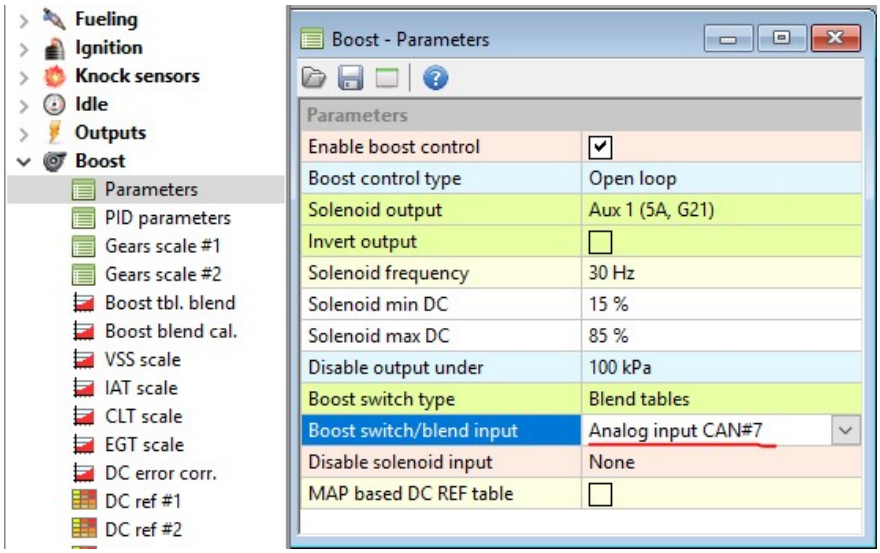


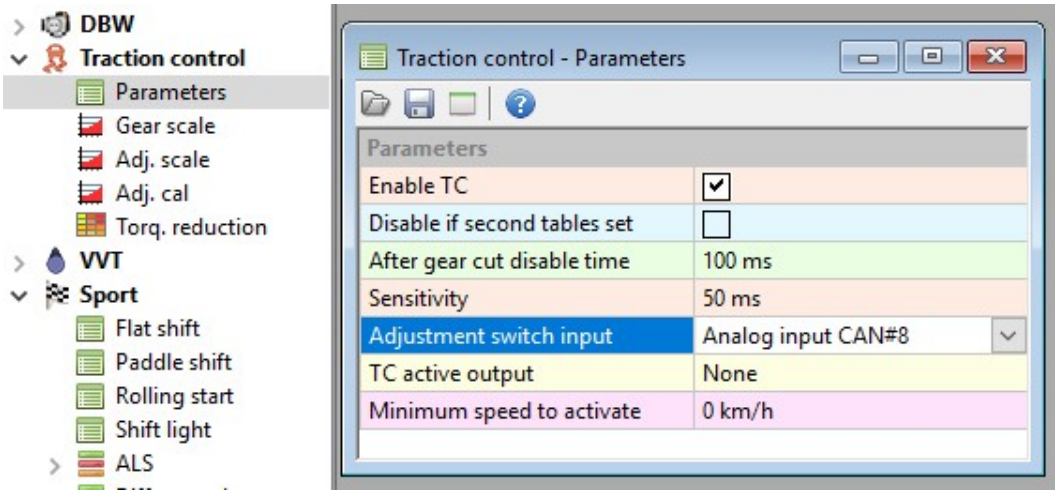
The data stream is as follows:

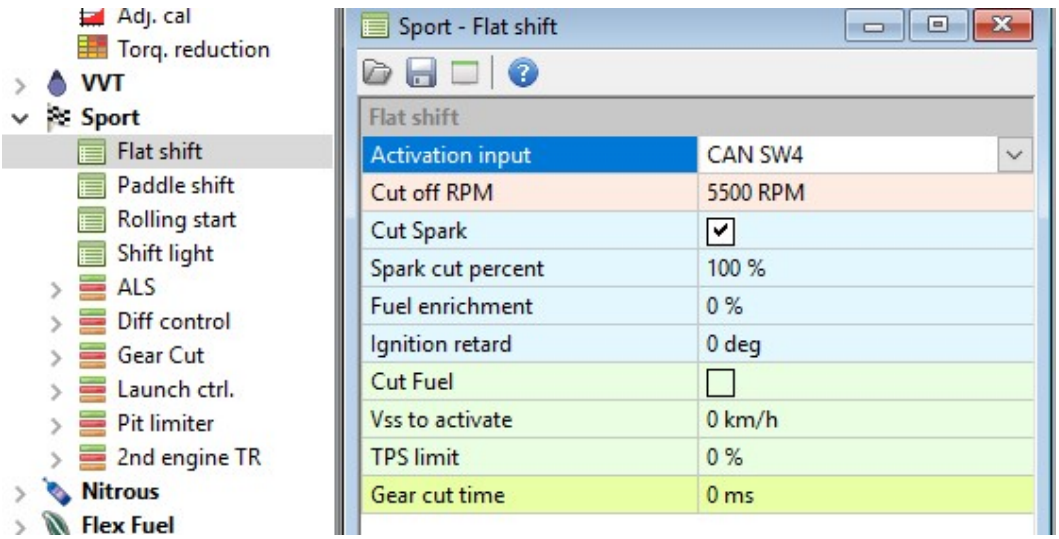
Analog Input CAN # 7 : Boost steps in millivolts.
Analog Input CAN # 8: Traction control slip steps in millivolts.
CAN Switch 1: Rolling Antilag
CAN Switch 2: Launch Control
CAN Switch 3: Nitrous
CAN Switch 4: Flat Shift
CAN Switch 5: Traction Enable / Disable

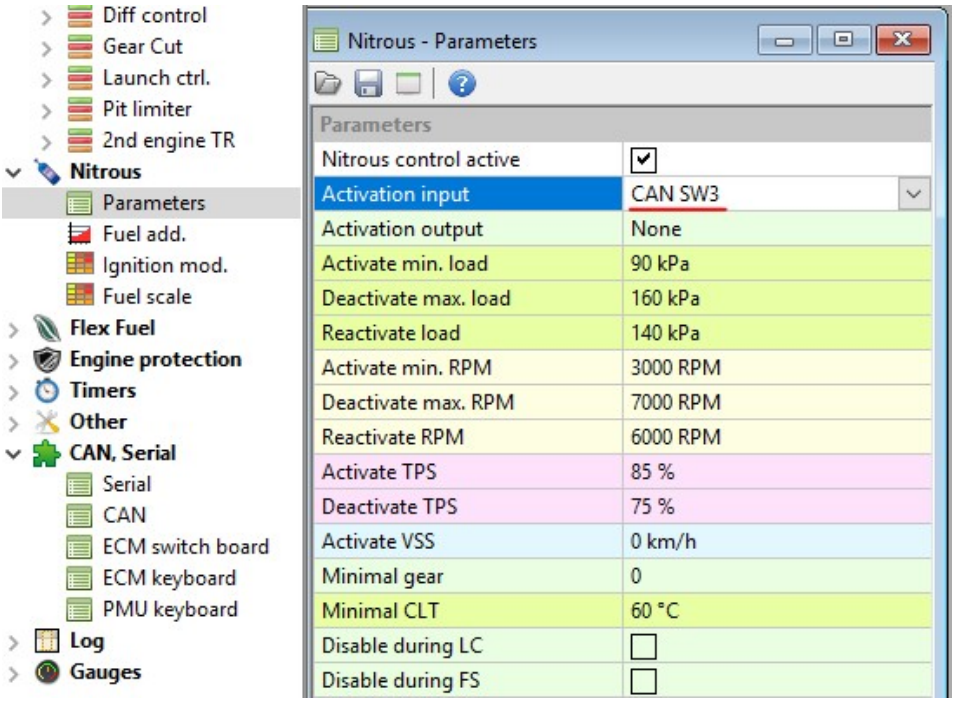
Example Configurations in the EMU software. Note that tuning strategies may differ and require additional configuration to complete the setup. BT Innovations, LLC will not be held responsible for tuning configurations or damage caused by misusing said tuning configurations

Note that the CAN value comes in as a voltage and the peak voltage is 5 volts. The Boost PWM steps and Trac PWM steps will determine how many positions will be used and the voltage value for each position will be the total of 5 volts divided by the number of steps.



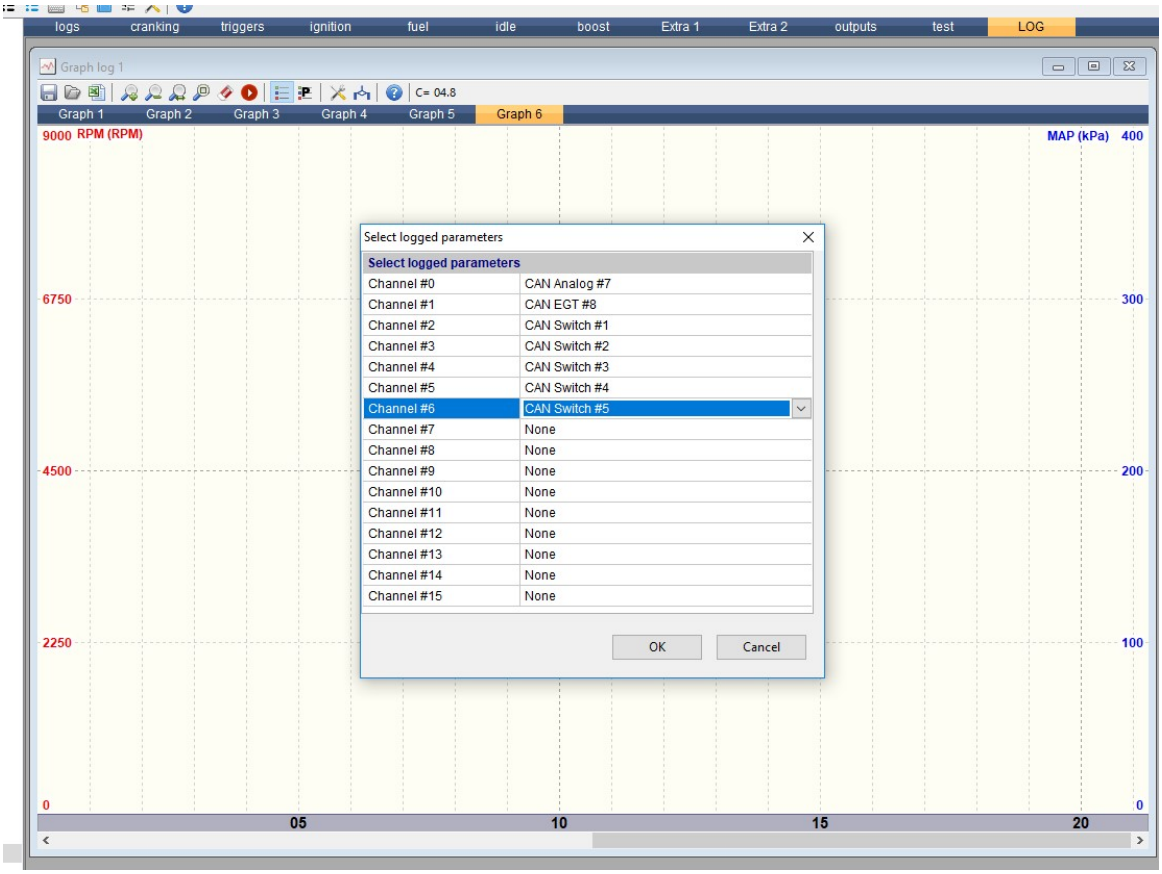

DBW
Traction control
Parameters
Gear scale
Adj. scale
Adj. cal
Torq. reduction
VVT
Sport
Flat shift
Paddle shift
Rolling start
Shift light
ALS
Traction control - Parameters
Parameters
Enable TC
Disable if second tables set
After gear cut disable time
100 ms
Sensitivity
50 ms
Adjustment switch input
Analog input CAN#8
TC active output
None
Minimum speed to activate
0 km/h


Adj. cal
Torq. reduction
VVT
Sport
Flat shift
Paddle shift
Rolling start
Shift light
ALS
Diff control
Gear Cut
Launch ctrl.
Pit limiter
2nd engine TR
Nitrous
Flex Fuel
Sport - Flat shift
Flat shift
Activation input
CAN SW4
Cut off RPM
5500 RPM
Cut Spark
Spark cut percent
100 %
Fuel enrichment
0 %
Ignition retard
0 deg
Cut Fuel
Vss to activate
0 km/h
TPS limit
0 %
Gear cut time
0 ms


Diff control
Gear Cut
Launch ctrl.
Pit limiter
2nd engine TR
Nitrous
Parameters
Fuel add.
Ignition mod.
Fuel scale
Flex Fuel
Engine protection
Timers
Other
CAN, Serial
Serial
CAN
ECM switch board
ECM keyboard
PMU keyboard
Log
Gauges
Nitrous - Parameters
Parameters
Nitrous control active
Activation input
CAN SW3
Activation output
None
Activate min. load
90 kPa
Deactivate max. load
160 kPa
Reactivate load
140 kPa
Activate min. RPM
3000 RPM
Deactivate max. RPM
7000 RPM
Reactivate RPM
6000 RPM
Activate TPS
85 %
Deactivate TPS
75 %
Activate VSS
0 km/h
Minimal gear
0
Minimal CLT
60 °C
Disable during LC
Disable during FS

Troubleshooting tips for CAN transmissions:

In order to verify theECU is receiving the CAN transmissions from the touch screen, use the logging screen to setup logs for Analog CAN #7, Analog CAN #8, CAN Switches 1-5



Warranty:

All BTI Gauges carry a 1 year warranty effective at the time of purchase.

- This warranty extends only to products distributed and/or sold by BTI Gauges. It is effective only if the products are purchased and operated in the USA. (Within the USA including US 48 States, Alaska and Hawaii.)
- This warranty covers only normal use of the computer. BTI Gauges shall not be liable under this warranty if any damage or defect results from (i) misuse, abuse, neglect, improper shipping or installation; (ii) disasters such as fire, flood, lightning or improper electric current; or (iii) service or alteration by anyone other than an authorized BTI Gauge representative.
- You must retain your bill of sale or other proof of purchase to receive warranty service.
- No warranty extension will be granted for any replacement part(s) furnished to the purchaser in fulfillment of this warranty.
- Warranty claims must be sent to sales@btigauges.com.